

REMARKS

This amendment is in response to the Final action of January 25, 2002, in which the Examiner objected to the claims for technical reasons. The claims have been amended to overcome the technical objections. In particular, the term 'plurality of unitary sidebars' has been changed to a 'plurality of uniform sidebars'. The apertured frame is described as 'unitary apertured frame.' The language is for the purpose of clarifying the previous amendment in which it was intended to describe the frame as a unitary structure with a number of uniform sidebars.

The Examiner rejected the claims as anticipated by Kitano or Yoo. The Examiner's rejection is respectfully traversed for the reasons set forth below.

The claims as amended clearly distinguish over the references which do not employ an apertured frame having uniform sidebars, and which is smaller in size than the dimensions of the chip so that the chip attach material does not form a fillet near the outer edge of the chip.

Yoo is unclear and inconsistent as to how it is formed. However, Yoo does not have a frame with uniform sidebars, but has pads with interconnecting damping members. The structure is not uniform and can result in stresses which can damage the chip.

Kitano, does not employ an frame with uniform sidebars. In addition, the outer edges of the support are near the outer edges of the chip so that the chip attach material can form a fillet near the edge of the chip and thereby initiate failure of the package. The entire outer edge of the frame of the invention is inboard of the outer edge of the chip. In Kitano, even though a portion of the support is recessed from the edge of the chip, it is not fully recessed, and this can allow a fillet of chip attach material to form near the edge of the chip. In the present invention this is avoided because the frame is smaller than the chip dimensions.

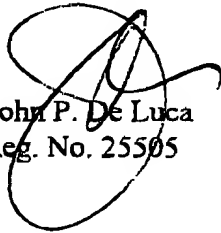
New claim 16 is similar to amended claim 1 but is written to cover a frame having a uniform size. However, the frame may be in the form of an annular member rather than a square.

1 The uniformity of the apertured frame reduces stress sources and the reduced size of the frame
2 avoids the formation of a fillet near the outer edge of the chip.
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4 Applicant's representative wishes to thank the Examiner for the opportunity to
5 discuss the proposed claims during a telephonic conversation conducted on May 2, 2002. During the
6 conversation, proposed claims were forwarded to the examiner for consideration and discussion
7 during the telephone conference. The claims proposed herein are different in that the outer edges of
8 the frame are recited rather than the chip support zone. The difference is believed to present the
9 claims more clearly.
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11 It is believed that the amendments herein place the claims in condition for
12 allowance, and no substantial new issues are presented which would require a new search or further
13 consideration by the Examiner. Entry and allowance of the claims is therefore earnestly solicited.
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15 Respectfully Submitted,
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VERSION SHOWING CHANGES

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1. (Three times Amended) A lead frame, for an integrated circuit chip having a frame engaging bottom surface for attachment to the frame by means of a chip attach material, said chip being formed with outer edges having defined dimensions, said frame comprising:

a unitary apertured frame having a central through aperture therein including a plurality of uniform sidebars each having an upper chip-supporting surface for engaging the bottom of the surface of the chip with the chip attach material therebetween,

each of said sidebars having an inner edge and an outer edge, said inner edges defining the central aperture,

said inner and outer edges being uniformly spaced apart defining therebetween a chip-support zone for the frame having defined dimensions,


said outer edges of the sidebars being recessed from the outer edges of the chip such that the frame is smaller a corresponding dimension of the chip, so as to avoid formation of a fillet of chip attach material proximate to the outer edges of the chip when the chip is attached to the frame.

16. (New) A lead frame, for an integrated circuit chip having a frame engaging bottom surface for attachment to the frame by means of a chip attach material, said chip being formed with outer edges having defined dimensions, said frame comprising:

a unitary apertured frame having a chip-supporting surface for engaging the bottom of the surface of the chip with the chip attach material therebetween, said frame having an outer edge, and an aperture formed with an inner edge defining the through central aperture,

said inner and outer edges being uniformly spaced apart defining therebetween a chip-support zone having defined dimensions,

1 said outer edge of the apertured frame being recessed from the outer edges of the
2 chip such that the frame is smaller than a corresponding dimension of the chip, so as to avoid
3 formation of a fillet of chip attach material to the outer edges of the chip when the chip is attached to
4 the apertured frame.
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